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The Defense of National Property.

THE greatest obstacle in the way of effective action for saving the forests on the nation's lands, is the lack of a clear understanding of the situation and of what it requires on the part of the people of this country. The problem is specific, limited and particular. It is not merely a topic for leisurely discussion and contemplation. One of the most important possessions of the nation is in imminent danger of extinction. An exigency now demands immediate and effective action, and the only alternative is ruin.

The plan presented in this journal three weeks ago, and to which we now recur, requires the immediate withdrawal from sale of all the public lands in the mountain forest-regions of the country, and the employment of the Army of the United States to protect these forests from injury and spoliation until a permanent policy for their care and preservation can be put in operation.

An emergency confronts us, and the employment of the army for this work of national defense is a necessity. If one of our great seaboard cities were demolished by a foreign foe, the loss to the nation would be far less than that which would result from the destruction of the forests on the lands now belonging to the nation. Or, if hundreds of millions were exacted as the price of escape from bombardment and obliterating flame, the subtraction from the nation's wealth which this would require would be trivial compared with the permanent extinction of the very springs and sources of national wealth and revenue which would be caused by the destruction of these forests.

The overwhelming and unanswerable argument for the adoption of this plan, and for the employment of the nation's army for the defense of the nation's property, is the fact that it is the only method which can be made efficient and successful. It is obvious that so much time would be required to prepare any other administrative machinery and put it into operation, that the forests would be extinct before the completion of an elaborate arrangement for their defense. But here is the best available machinery for the protection of this invaluable national property ready to our hands in the thorough organization and intelligent efficiency of the Army of the United States. Its officers are superior men, who have been trained at the expense of the nation, and they are already in its paid service. There is not at present any other service so important as this in which the army can be employed.

As for official or Government work in forestry in this country, nothing could be attempted that would so strongly tend to vitalize and popularize it, as the success of the scheme which we have proposed. Official persons often justly complain that they are not sustained in their work, as they should be, by public interest and sentiment. There is no other way in which intelligent and public-spirited citizens can so efficiently co-operate with all that is vital in the forestry work of the national Government, as by urging the adoption of the plan we have presented—the immediate withdrawal from sale of all the public lands in the mountain forest-region of the West, and the employment of the United States Army to guard these forests until a plan for their permanent administration has been completed.

New Varieties.

MONSIEUR ANDRÉ, in a recent issue of the *Révue Horticole*, calls attention to the difficulties which confront the purchasers of plants who are obliged to rely, in making their selections, upon the glowing and interested statements of value with which new plants are habitually put upon the market:

"Plant-buyers, no matter what class of plants they are interested in, must often find themselves confused if they consult the catalogues of dealers. The immense number of new varieties now obtained on every side, and named and described as possessing every desirable quality and virtue, must cause a well-nigh hopeless embarrassment. If they are not fortunate enough to possess some work upon gardening containing authoritative lists of the different varieties of garden plants, they must buy on the strength of the catalogue descriptions, and then be compelled to throw away, as worthless, a large part of what they have bought, or else continue to cultivate inferior forms. The way to prevent this is simple; and it can, with a little trouble, be arranged. It is only necessary to establish, for the different classes of ornamental plants, juries of approval, of the same character as the pomological congresses, which have successfully established the nomenclature and the merits of cultivated fruits. Monsieur Godefroy-Lebeuf has recently suggested such a plan in the case of Orchids; but every new plant, no matter of what class, should be submitted to a jury of specialists to determine if it merits recommendation, if it is not already cultivated under another name, or if it is really worth cultivation for any particular purpose or special reason. The question is certainly somewhat complicated, but it can be solved to the satisfaction of intelligent producers of new plants and of all plant-buyers."

American plant-buyers suffer, perhaps, more than those of any other country, from exaggerated statements regarding new plants, which too often appear in trade-catalogues, because Americans are, as a rule, more easily misled by glowing advertisements than Europeans, and because in America trade-catalogues are too often the only sources of information about new plants and horticultural matters generally, with which plant buyers provide themselves.

An international jury, or a number of juries, to pass upon all new plants originated in England, France, Belgium, Holland, Germany and the United States, might, perhaps, be impracticable, but there ought to be no very serious or insurmountable difficulty in organizing such juries in Europe, with an American jury of American specialists to confirm, so far as the United States is concerned, the action of their European associates. It is pretty evident that the vast numbers of varieties of garden-plants which are now produced every year must, sooner or later, necessitate some such plan as this, and the sooner it can be perfected, and put in good working order, the better it will be for every one interested in horticulture. The producers of valuable varieties would gain as much,

and perhaps more, from the endorsements of such juries as the people who buy plants, for they would buy all the more if they could feel assured that they were getting what they were asked to give their money for.

Private letters from Philadelphia indicate that there is a chance, if the financial support of public-spirited citizens can be obtained, to put into execution at last the long-cherished plan of acquiring, for public uses, the site of Bartram's Gardens, the first botanical garden established in the United States, with the house built by John Bartram, the famous Philadelphia botanist, and many of the trees planted by him. This spot has for years been the Mecca of botanists and horticulturists. There is no other more interesting to them, and none so filled with associations connected with the early development of botanical science in America.

This opportunity is an important one, therefore, and we trust that it will be improved. The public spirit and civic pride of Philadelphia's leading men are known all over the civilized world, and there can be no doubt that as soon as this matter is once understood they will not consent to see this spot, at once so valuable on account of its historical associations, and so convenient and suitable for a public breathing-place and pleasure-ground, given up to the demands of commerce. The land should be acquired in such a way, or on such terms, as would permit some permanent special supervision of it by some body of men who would be specially interested in the historic character of the place—the University of Pennsylvania, or the Academy of Natural Science.

If it becomes merely one of the city parks, under the general management of some branch of the city government, it would inevitably lose all its distinctive or special character and interest.

The taste for museums and in-door collections of all kinds, and the habit of giving large sums for their establishment and maintenance, are valuable and encouraging features of our national character; but we must strive to make the out-of-door life of the inhabitants of our great cities more attractive, healthful and interesting; and places of historic or other special interest should be utilized for purposes of this kind whenever it is practicable.

The name of Bartram's Gardens should be preserved, and in order that it shall have any significance or appropriateness, should be maintained in as near the condition as its first owner left it as is practicable. Whether any other features of a botanic garden would be practicable is, we suppose, rather doubtful. But the name of a distinguished man is a precious possession to a great city and a potent influence in popular education and the development of civic patriotism. We hope to hear that definite steps have been taken to purchase the old garden and to perpetuate the interest of the place.

The Daily Mirror and American, published in Manchester, New Hampshire, calls attention to the fact that the statement, recently made in our columns, that six million feet of Spruce timber were to be cut this winter from the immediate vicinity of Mount Washington, give a very inadequate idea of the damage which is being inflicted upon the forests of northern New Hampshire.

"The Connecticut River Lumber Company, whose headquarters are at the Connecticut lakes, will probably put into the streams this winter nearly a hundred millions of Spruce. The Brown Lumber Company, of Whitefield, and the Berlin Falls Company will cut twenty million feet each, the Kilkenny Lumber Company half as much more, and half a hundred other firms and individuals will contribute very much to the destruction of the forests north of Woodsville and Conway. Instead of six million feet, which a stranger might infer from the statement made was the total output of our northern mills, it must be several hundred millions. But this only emphasizes the fact that one of the chief glories and sources of wealth of our northern counties is fast disappearing before the woodman's axe to return no more, for the mountain sides from which this timber comes do not reproduce a growth as land does in this part of the state, and when once stripped they remain bare. With the forests departs much of the beauty, the grandeur and the attractiveness which have made our mountains famous as health and pleasure resorts. When the woods have been cut away, the White Mountains are about as bleak and barren a section of country as we know of, and when there are no timber lots left the charm that was formerly theirs will be wanting. Even the Profile, the Franconia and Crawford Notches and Mount Washington would lose much of their glory and beauty with the destruction of the forests in which they are set, and the territory about them, when stripped of trees, would be one to shun.

"It is but a few years, comparatively, since nearly all these forests were owned by the state, and it was a terrible mistake when they were sold for a song to speculators. Most of the timber lands in Pittsburg, and many in other townships, were sold for twenty cents an acre during Gov. Harriman's administration. Perhaps this was all they were worth to sell at that time, for with the nearest railroad forty miles away no one could realize much by clearing them; but some one ought to have been far-seeing and wise enough to have concluded that in a few years they would be worth a hundred times what they sold for, and that the state could not afford to sell them at any price. Other immense tracts have been sold for even less per acre, or given away to Dartmouth College or some of our academies, which have turned them over, for a nominal price, to the lumbermen."

These statements are quoted, not only because they emphasize the words of Mr. Harrison in another column of this issue, but because they invite attention to the broader fact that what has happened in New Hampshire is now happening in other parts of the United States. Valuable forests are being frittered away in the South and in the West without any adequate return. But the experience of New Hampshire, expensive and disastrous as it has been, may yet have some value as a warning to the people of other states. On no part of this continent today are there any forests so remote from existing means of transportation that they will not soon be called upon, if they have any value whatever, to give up their quota to supply the wants of our rapidly increasing population.

Some Old American Country-seats.

I.—The Gore Place.

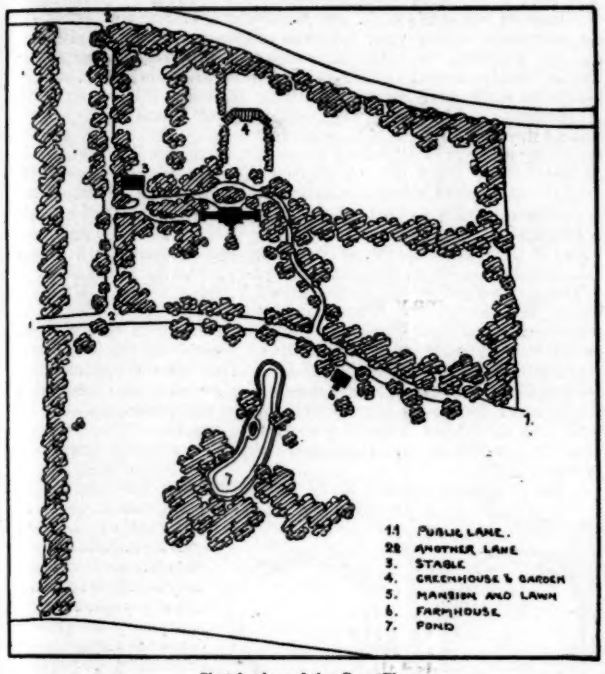
JOHN WINTHROP, first Governor of Massachusetts, had his country-place. It lay upon Mystic River, and was called Ten Hills. The pleasures of life there were certainly peculiar, wolves and prowling Indians being frequent visitors; but now that several of the ten hills have been even destroyed, Winthrop's frontier "paradise" can only be imagined, not described. Unfortunately the same must now be said of almost all the mansions and gardens of the later aristocratic time which preceded the Revolution. The rising tide of population has swallowed up the handsome establishments of Tories and patriots alike. The Craigie house, which the Longfellow family preserves in Cambridge, is now almost the sole surviving representative of the terraced and high-walled stateliness of the colonial days.

Boston and her surrounding sister cities grow continually. Farm after farm and garden after garden are invaded by streets, sewers and water-pipes, owners being fairly compelled to sell lands which are taxed more and more heavily. Before destruction overtakes the few old seats now remaining, it will be well to make some sort of record of their character and beauty.

About eight miles from the State House, one of the roads of the Charles River valley, after passing through a somewhat squalid manufacturing district, suddenly becomes a rural lane, which winds its shady way first past the low-roofed farm-house and then past the lawn and mansion of what is plainly an old estate. The accompanying picture on page 91 shows the house as it appears from just within the trees which shade the lane. The grass sweeps up to the walls of this long, south front. No line of any sort breaks the flowing breadth of the lawn, for the approach-road, which leaves the lane near the farm-house, goes around through the trees to the door in the north front of the house. The simple but well-proportioned building is set off against a background of foliage, and the ends of the low wings are shadowed by tall Pines and Chestnuts, whose brothers, forming noble masses at the sides of the lawn, support and frame the house, and, joined with it, compose

one satisfying picture. On the further side of the lane is an open field and a winding pond, whose distant further end is lost in the shadow of a Pine-wood, from out the edge of which a White Birch leans over the water. Larches, too, and small Beeches, grow in the edge of this distant wood, and enliven the darkness of the Pines in spring and autumn, while here and there above the tops of the trees appear the crests of low hills, a mile or two away beyond the river.

This strikingly peaceful and lovely scene, so religiously preserved by its present owner that he can say that only the gales have harmed it since he came into possession more than thirty years ago, impresses the most casual passer-by, and teaches owners of country-seats a lesson of first importance. Here is not one rare tree, not a single vegetable or architectural wonder, not one flower-bed or ribbon-border; only common trees, grass and water, smooth ground and a plain building. The scene is interesting, impressive and lovable, and it is this solely by reason of the simplicity, breadth and harmony of its composition. This is real landscape-architecture of the purest type, in comparison with which all modern arrangements of specimen fancy trees must always appear ineffective as well as inappropriate.



Sketch-plan of the Gore Place.

The lands about this mansion, once a part of the so-called Beaver Brook Plowlands, were first owned by the beloved first minister of the colonial church of Watertown, the Reverend George Phillips. After his death, in 1644, certain of the Garfield family became the owners, and when Mr. Christopher Gore bought "the forty-acre lot," about 1791, he entered upon lands which had been the home of excellent people during a full century and a half. Mr. Gore was sent to England in 1796 as one of the Commissioners under Jay's treaty, and one wing of his house having been burned in his absence, he caused the present mansion to be built of brick and made ready for his return in 1804. It is said that he brought with him an English landscape-gardener, and certainly the old place bears every mark of the distinctive style of Humphrey Repton, whose book on landscape-gardening was published just before Gore's visit to Europe. The brick house, which is painted white, contains many finely proportioned rooms. Two doorways open upon a long platform on the north front. Between these doors stretches a hall dining-room, with a marble floor, and fire-places at each end. The large bay in the south front contains an oval drawing-room; on one side of this room is a breakfast-room, and on the other a parlor; the east wing contains a billiard-room, the west the kitchen and offices.

The carriage-turn, and the whole north side of the house, is crowded with large trees; many Hemlocks, whose soft boughs sweep the ground at the edge of the drive, several Umbrella Magnolias among the Hemlocks, some large Lindens, and many very tall White Pines. Just beyond is the flower-garden, carefully sheltered and quaintly laid out in geometric fashion, with great banks of shrubs at the sides, plenty of smooth grass, and large beds crowded with perennials in rich, old-fashioned array. A small enclosure for deer adjoins the garden; two smooth and open hay-fields are close at hand, and around all this forty-acre home-lot stands a dense belt of forest-trees, shutting out the commonplace world and affording a pleasantly shady walk of something like a mile in length.

Mr. Gore lived to be Governor of Massachusetts and United States Senator. One of the later owners of the place, Mr. Theodore Lyman, 2d, made the pond beyond the lane, and built the present approach-road, and both he and the present owner planted many trees; but every proprietor since Mr. Gore's time has respected the character which was impressed upon the scene in the beginning; nothing to-day appears incongruous or out of place. If the Governor himself could walk about this country-seat to-morrow he would certainly be very proud to own it his.

Boston. *Charles Eliot.*

Winter in the Pines.

IN a winter ramble there is much revealed that is hidden or passed by in summer. The leaves have fallen from the deciduous trees, and we see more clearly their shape and size. During my woodland walk to-day I measured a tree and found it to be over nine feet in diameter. Its gnarled branches and scarred trunk told of the centuries that had come and gone since, as an embryo, it first sent out its little plumule to the light. This old monarch is but a common Chestnut (*Castanea vulgaris*, var. *Americana*), but its great horizontal branches, each one as large as a fair-sized tree, give it an immense expanse of shade, with a venerable and protecting expression which would be marked even outside of the Pine Barrens, where, it is imagined by people unacquainted with our forests, that only scrub Oaks and scrubbier Pines abound. In the immediate vicinity of this large tree were several Oaks from three to five feet in diameter. And beautiful Hollies, and Laurels and Cedars and Pines, were all around, which, together with the unusual warmth of this January weather, conspired to give the impression of a sub-tropical land. Grape-vines had climbed to the tops of the tallest trees, and not contented with one support, they had reached out and clasped others, binding them together and forming dense bowers beneath. Other woody climbers were also here. The Virginia Creeper and Bittersweet and various species of Smilax were abundant.

Birds twittered and sang and watched us from evergreen boughs, and woodpeckers and creepers were on the naked trunks and branches, always keeping us in view with the same angle of observation, no matter how often we made them revolve around the trees, or tried to circumvent them. Not so with the little Chicadee, however; he was willing to be on quite familiar terms, following us with his merry music, hanging and clinging to small twigs just above our heads, with back down, but all the time keeping a sharp, inquisitive watch upon the invaders of his domain.

Leaving the big trees and the bright moss that carpets the ground beneath them, and the prickly Smilax that hedges them in, we turn toward the more open barrens. Here, amid a goodly forest of trees from one to two feet in diameter, we find many old charcoal beds. The forest must have grown up since the sooty burners left this region. They usually make a clean sweep of the wood over quite an extensive tract, except perhaps a few trees that are left to shade the huts where they live during their forest raids. And this, no doubt, is the reason that we occasionally find small groups of large trees scattered here and there throughout southern New Jersey.

Probably there is not as much demand for charcoal now as there was fifty years ago. Still large tracts of timber are annually burned to supply the demand. But in New Jersey, for some reason, probably because the soil is so productive, no arid wastes are left, but young trees immediately spring up in the place of the old, and in a quarter of a century or so there will be quite a respectable forest to hide the former devastation. In the old charcoal beds to-day a glad surprise awaits me. The little *Draba verna* is in full bloom, standing thickly over the blackened spots, where the direct rays of the sun have more powerful effect than on the surrounding light soil, and bring the little plants forward as if in a hot-bed.

Dr. Gray was inclined to the opinion that this plant was not indigenous to our soil. If not, the seed must have been distributed in these forest fastnesses through the agency of the early charcoal-burners, or possibly birds may have been the agents, as I have often seen our little field sparrow (*Spizella*

pusilla), and the pine linnet (*Chrysomitris pinus*), and the thistle bird (*C. tristis*), eating seeds from plants growing on the roadsides and in fields.

Passing on through these open barrens, we soon reach a dense Cedar-swamp, which for several seasons past I have promised myself I would explore in the winter. Along its borders we find the rare local *Helonias bullata* growing in large clumps, with leaves fresh and bright, somewhat resembling those of the old-fashioned White Lily (*Lilium candidum*); but the leaves are more shining and larger, and withstand the frost better than the Lily. And very beautiful they are here in mid-winter, standing up in great rosettes, and looking more appropriately placed and beautiful than they ever do in a garden.

What I saw within the gloom of the Cedars must be told in another letter.

Vineland, January, 1889. *Mary Treat.*

History of the White Lilac Industry.

FOR a long time it was generally, and even now is by many, believed, that to obtain White Lilac flowers during winter, the plants should be forced in a dark place. Such, however, is not an absolute necessity by any means; it is practically a question of heat, and, given this, White Lilacs can be easily produced in fully-lighted houses. The varieties mostly grown for this purpose are Charles X. and Rouge de Marly, both of which are cultivated in enormous quantities in France, and also in England, for forcing. Formerly Covent Garden was supplied almost exclusively from France, but now many English establishments are devoted to this special branch of the flower-trade. In some of these a system prevails by means of which the bushes to be forced are retarded to such an extent that the flower-market is furnished with fine White Lilacs (forced) long after unforced bushes in the open air have ceased flowering. The exact means adopted to secure these results are not divulged by those who practice them; the rough-and-ready plan of stripping off all the leaves of established plants in the open air, and so causing a second growth and a crop of flowers in autumn, is, however, not the one adopted by the Covent Garden growers. The white-flowered forms are not used for early forcing, they are not sufficiently vigorous, and the two red-flowered ones above-mentioned are almost invariably used. The red coloring matter, however, exists in such a quantity in some—for instance, Andenken and Ludwig Späth, a handsome dark-colored form of recent origin—that, even in the dark, white flowers cannot be produced.

In connection with this subject, the historical notes of M. Héring, in a recent volume of the *Journal de Botanique*, are of especial interest. As early as 1820 we learn that several French gardeners had tried the forcing and bleaching process, but not with any degree of success. Their plan was to make towards Carnival-time a deep hole, put fermenting material in the bottom, and cover the top with boards and straw. By this means in a fortnight or three weeks they obtained flowers which had lost a portion of their redness, but which were far removed from the snowy purity of those produced at the present day.

When hot water began to be successfully used for heating plant-houses a new era commenced in the Lilac industry, and in the winter of 1858 Paris society had its floricultural sensation in the pure White Lilacs, grown by M. Laurent, a Parisian florist. His plan was to take bushes from the open ground, plant them in a house which was kept day and night at a temperature ranging from 86° to 95° Fahrenheit, and under these conditions it took less than three weeks to get flowers. Madame Furtado, at the *Chateau de Roquencourt*, and M. Lavallée, at the *Chateau de Segrez*, among others, began to force Lilacs, and the latter, during his Presidency of the *Société Nationale d'Horticulture de France*, exhibited to the Society perfectly White Lilac which had been produced in a fortnight in full light in a house heated from 95° to 105° Fahrenheit.

The Marquis de la Ferté, *Chateau du Marais*, tried the cultivation in an Orchid house (in full light), with a temperature of from 59° to 68° Fahrenheit, but the flowers did not change markedly in color; the heat was insufficient, and the same results were noted at Segrez whenever the thermometer was not allowed to rise above 68°. Even in the dark, with comparatively low temperature, flowers become rose-tinted. So far M. Héring.

A few words may be written, however, about forced colored Lilacs. As is evident enough from previous remarks, the bushes must not be subjected to nearly so much heat if normally-tinted flowers (and for these, too, there has arisen a large demand) are required. For pot-culture it is best to graft or bud the desired varieties on stems of *Ligustrum ovalifolium* or of *L. vulgare*. The plants thus treated make short, stubby growth, and set very freely, but they will not bear early forcing. *Syringa Chinensis* makes a delightful pot-plant, and this species it is usual to bud on two-year-old seedlings of the common Lilac (*S. vulgaris*). This operation takes place at the end of July. The next spring, as soon as the growth is as long as the finger, it is stopped, and by autumn a fine head is formed. Early the following spring the little trees are potted and the pots plunged in the open ground. An abundant water supply is necessary to induce a vigorous growth. In the middle of July the pots are taken out of the ground and less water given, in order to ripen the shoots. In November the pots are covered with some material to prevent frost from breaking them, and the plants are ready for removal to the forcing-house as required.

Kew, February. *G. Nicholson.*

Cultural Department.

Hybridization of Gladioli.

IN 1885 I prepared to raise Gladiolus-hybrids by planting a row of the species *G. purpureo-auratus* among rows of Gandavensis varieties for the sake of convenience in hybridizing the flowers. Similar plantings of *G. dracocephalus* were made. Many flowers of *G. purpureo-auratus* and of *G. dracocephalus* were used as the pistillate parents. Some hybrids were attempted in the reverse order, using Gandavensis varieties as the pistillate parents, with but little success, and as the resulting seed was not kept separate, no notes can be given on this cross. The stamens were removed from all flowers to be hybridized while in the condition of unopened buds. The pollen was removed from the cells of the anthers with a sharp-pointed stick, and transferred directly to the stigmatic surface. This, in practice, was found the simplest method with Gladioli, although with most plants a camel's hair brush is best.

The hybridized seeds were planted in April, 1886, in shallow boxes, and so grown throughout the summer. About midsummer, when the leaves attained a considerable height, fine sifted cow-manure was spread over the soil in the boxes to the depth of half an inch or more. This proved beneficial as a mulch and source of liquid-manure at each watering. In autumn the bulbs were sifted out of the earth and kept in boxes, as they have been in succeeding winters. The second year the seedlings were planted thickly in rows in the open ground.

I was informed by Mr. W. E. Endicott, who has had large experience with hybrids of *G. purpureo-auratus* that flowers not artificially fertilized would yield hybrids when the plants are grown near to Gandavensis varieties. Therefore, the artificially fertilized and naturally fertilized seeds were planted as one lot. The seed proved highly fertile, and yielded as many plants as do seeds of ordinary Gandavensis varieties.

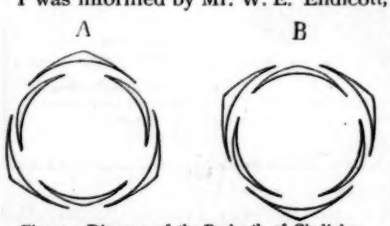


Fig. 95.—Diagram of the Perianth of Gladiolus.

About twenty-five hybrids of *G. purpureo-auratus* bloomed in 1887, the second year from seed, and were essentially similar to those which bloomed last summer. Many bulbs accidentally overlooked when digging in the autumn of '87, grew finely last summer, which is strong evidence of the hardiness claimed for the hybrids, as the winter of '87–'88 was extremely severe.

During the summer of 1888, 175 purpureo-auratus hybrids bloomed for the first time, and careful notes were taken of each plant.

Before discussing the hybrids, a few preliminary notes are necessary. In the Gandavensis varieties (the ordinary Gladioli of gardens) the segments of the corolla are arranged on two anthotaxic* plans. The first and most numerous arrangement is that shown in *A* fig. 95. The uppermost segment of the perianth is without, overlapping the adjoining segments; the lowermost within, embraced by its contiguous segments; the upper pair of laterals are overlapped by the lower pair of laterals; the lower pair of laterals overlap their adjoining segments. The other arrangement of the segments is shown in *B* fig. 95. The uppermost segment overlaps the adjoining

* "Anthotaxy, denoting flower arrangement. A name formed on the analogy to phyllotaxy, or leaf arrangement." Asa Gray, "Structural Botany," Part I., p. 141.

laterals; the lowermost overlaps its laterals; the lower pair of laterals is wholly within, and the upper pair of laterals is wholly without their adjoining segments. A single spike may be composed of flowers of the first arrangement (*A*) wholly, or it may have flowers of both arrangements in varying numerical proportions; but the first (*A*) as far as noted always predominates. Flowers of the second arrangement (*B*) may be the first, last, or scatteringly intermediate on the spike. The two arrangements are fundamental in the flower, they are not brought about by twists in the segments. The arrangement of the cells in the ovary coincides with the varying relative position of the segments.

In *G. dracocephalus* all the flowers, in the large number examined, were arranged as in *B*. The same is true of *G. purpureo-auratus*. Only a few flowers of *G. Saundersii* were observed when this character was in mind; but those were of the second arrangement. *G. psittacinus* is the only species where a variation of the arrangement was noted. Int his species most of the flowers were arranged as in *A;* but a very few were found of the type of *B* in the diagram.

The existence of two plans of flower-arrangement on a single spike in a true species would be anomalous, and I consider its occurrence in hybrid Gladioli due to the inheritance of mixed blood; the arrangement (*A*) being due to certain ancestral species, and the arrangement (*B*) to other ancestral species. This suggestion is borne out, in fact, by the hybrids of *G. purpureo-auratus*, for, as noted below, both arrangements are found in the hybrids, although the form *B* only is characteristic. It is quite possible that, by following this character out one might be able to trace the origin and kinship of species and garden-hybrids of Gladioli.

The species *Gladiolus purpureo-auratus*, used as the pistillate parent, is well represented in the illustration upon this page. The flowers are deep, tubular, and bell-shaped. The arrangement of the segments is as in *B*. On the central lower petal is a narrow blotch, and on the adjoining laterals broad, elongate blotches of dull maroon-crimson. At the base of the blotches, near the centre of the flower, the color heightens to a rich crimson over a very small area. This rich color is an important fact in the result obtained in the colors of the hybrids, where the whole blotch is commonly a rich crimson. On the margin of the blotches is a lip-like splash of golden yellow (not shown in the figure). The color of the rest of the flower is a pale greenish-yellow. The plant grows to the height of about four feet, with foliage narrower than in Gandavensis varieties. The flower-spike grows in a graceful subarcuate fashion, quite distinct from that characteristic of Gandavensis varieties or of any species with which I am acquainted. The flowers are arranged rather far apart on the stem; they all face in one direction, and in view of the arcuateness of the flower-stalk, and pendant, bell-shape of the flowers, their interior is not easily seen. The corms of *G. purpureo-auratus* are not very large. They bear bulblets at the base, and, in addition, small corms at the tips of the characteristic running root-stocks, one of which is shown in the figure. The species is distinct, and different individuals vary little. The only variation noted was a specimen which had a richer yellow than common in the lip bordering the maroon blotches.

Fig. 96.—Gladiolus purpureo-auratus.—See page 88.

The Gandavensis varieties used as the staminate parents were a choice lot of named varieties and seedlings.

The quality of the Purpureo-auratus hybrid seedlings was of a high order. Of the 175 which bloomed, ten per cent. were plants worthy of a place with the best named varieties. Thirty-seven per cent. were well worthy of general cultivation. Fifty-three per cent. were of medium quality, indifferent or poor. In estimating quality, color was considered of first importance, and, after it, form and arrangement.

All the flowers, without exception, were colored—white,

pink, red, crimson, maroon, etc.—thus showing the Gandavensis blood. In many the color was of a peculiar magenta-pink, quite similar to that often seen in Magnolias. This color existed in none of the Gandavensis parents and was distinct from any that I have seen in Gandavensis varieties. Twenty-six per cent. of the hybrids were marked on the lower segments by the characteristic shape of the blotch in *G. purpureo-auratus;* but, instead of being dull maroon-crimson, in most cases it was rich crimson, the color found at the base of the blotches in the species parent. This is an interesting and striking fact. Only eighteen per cent. of the hybrids had the characteristic Gandavensis stripe on the lower segments, and fifty-three per cent. had markings which in shape were a combination in varying proportions of the linear stripe of the Gandavensis and the blotch-like stripe of Purpureo-auratus flowers. The yellow splash at the margins of the maroon blotches in *G. purpureo-auratus* is largely inherited by the hybrids, but is often wanting. It was noted in nearly half of the seedlings. Not infrequently the form of the yellow splash is retained, but the color is replaced by white. The arrangement of the segments in most of the flowers was that figured in *B* alone like the species parent; but exceptions were frequent in which the arrangement *A*, found so predominantly in the Gandavensis varieties, also existed, but always in a few flowers only of a spike. The form in eighty per cent. of the flowers was sub-open or flaring, being close to the form which would be made by modeling a pattern half way between the two parents in shape. Some were widely flaring, remotely resembling a full blown Magnolia in shape. A few flowers (eight per cent.) were deep bell-shaped, like the Purpureo-auratus parent. A few others (nine per cent.) were close to the Gandavensis parent in shape. The size of the foliage and habit of the plants was half-way between the two parents in ninety per cent. of the hybrids. A few (ten per cent.) tended toward the greater size and rigidity of the Gandavensis parents. The corms bear small corms at the tips of the stoloniferous underground side-stems, thus following the character of the species parent. The percentage in which this character occurred was not ascertained, but it was generally present.

Out of 175 hybrids flowered, only three closely resembled the Gandavensis parents, two were close to *G. purpureo-auratus*, but they showed the foreign blood by being shot with red. Mr. Endicott, in a recent paper,* noted that he had only had two plants showing pure blood from many hundred seedlings raised from *G. purpureo-auratus*. This statement, with my own observations, leads to conclusions of great interest and importance. It proves the complete union of the parents in the hybrid offspring, there being very rarely or never individuals which copy either parent to the complete exclusion of the other. It proves, also, the extreme potency of foreign pollen on *G. purpureo-auratus*. This would not be expected, as the pollen of its own species would be supposed, on all common principles of fertilization, to be prepotent.

In the hybrids, the shade of color, the crimson central blotches and the flaring form of the flowers may be considered the new characters developed by the mixed blood. They are the characters due to the cross, of which traces only can be found in either parent. The hybrids, in a most remarkable degree, were, roughly speaking, half way between the two parents in form, coloration, marking, habit, etc.

Mr. Charles Putnam, of Salem, raises many Purpureo-auratus hybrids. He uses for the pistillate parent the variety known as Lemoinii, which is itself a hybrid between *G. purpureo-auratus* and *G. Gandavensis*. His staminate parents are Gandavensis varieties. The seedlings which he raises are largely very close to or nearly identical with Gandavensis varieties, which is further proof of the complete union of parents in the offspring, as his seedlings are three-fourths of Gandavensis blood and only one-fourth Purpureo-auratus, and therefore would be expected to lean toward the Gandavensis parent.

Mr. C. Sander has originated a hybrid between *G. dracocephalus* and *G. Gandavensis*, which promises to produce a line of hybrids of much importance.

G. dracocephalus is a tall, strong-growing species with hood-shaped, yellowish green flowers, netted with very small linear red dots. The only approach to a stripe in the basal segments is the omission of the red, leaving a pure yellowish green line. The species produces very large bulbs and an abundance of bulblets. With high culture I have grown this species and its hybrids to the height of six feet. A few of the hybrids were given me, and in 1885 seed was saved from which during the past summer ninety-six seedlings bloomed.

The flowers were naturally fertilized, and, judging from the results, probably largely by Gandavensis pollen. The type species was fertilized with Gandavensis pollen, and perfect seeds matured, but as unfortunately they were planted with seeds from the hybrids, no notes can be given on them separately. None of the hybrids approximate to the Dracocephalus type, but many come close to the Gandavensis, indicating, as was probably the case, that the blood was three-fourths gandavensis. The great value of the hybrid is the strength, size and floriferousness of the plants and the unique form and marking of the flowers, due to a combination of the characters of both parents.* One of the most important features of these hybrids is that a large percentage bear flowers entirely free from stripes in the lower segments. This is a character due to the Dracocephalus blood, and will be highly appreciated by Gladiolus-growers, because of the possibility it offers of obtaining flowers of whole colors. The characteristic carmine stripes of Gandavensis varieties make often, and it might be said commonly, an inharmonious contrast with the ground color of the flower. Several crimson, pink and red Gladioli of this cross of various shades, and of great beauty, bloomed, and were distinguished by the fact that the colors were pure and the stripe wholly absent. This is suggestive, as other species having no stripes or blotches, and desirable markings would doubtless tend to give to hybrid offspring their special features, as is so clearly seen in hybrids of *G. dracocephalus* and *G. purpureo-auratus* when crossed with Gandavensis pollen.

One seedling of much interest was produced. The pistillate parent was *G. purpureo-auratus*, the staminate a Dracocephalus and Gandavensis hybrid. The result was a flower combining the characters of all three parents in a marked degree. The form was a combination of that characteristic of the Purpureo-auratus and Gandavensis parents, with sharp, pointed petals; color, dull magenta-red, bearing the characteristic Purpureo-auratus and Gandavensis blotch in the three lower petals. On the margin of the blotches, in the middle of the two lateral petals, was a blotch of distinct mottled yellowish green. In the centre of these blotches was a line of clear yellowish green. This color and the mottling were the only Dracocephalus characters noted, but they were so distinct and are so characteristic of the species that no doubt can be entertained of their origin. Four other Gladioli from seed of *G. purpureo-auratus* were noted, which, in color and peculiar hood-like form, showed the blood of the triple parentage.

The complete combination of parents in plant-hybrids is shown in a marked degree in the fine hybrids sent out by V. Lemoine, of Nancy, under the name of *Montbretia crocosmiæflora*. I have grown five of his hybrids, and they are all directly intermediate between the parents, which are *Montbretia Pottsii* and *Crocosmia* (*Tritonia*) *aurea*. The combination is seen in the color, size, form and habit of the inflorescence. Some swing toward one parent more, some toward the other, and there is a brilliancy of color in several of the hybrids far exceeding that of either parent.

The hybrids of *Gladiolus purpureo-auratus* and *G. Gandavensis* and of *G. dracocephalus* and *G. Gandavensis* are entirely fertile, and the seed grows easily. The Montbretia hybrids, above noted, also seed freely, so that there seems here to be none of that whole or partial sterility attributed to true species-hybrids in plants and animals.

The pollen of *G. purpureo-auratus* is much less active on Gandavensis varieties than the reverse cross, and attempts to make this cross were attended with little success. The same is true of crosses tried with dracocephalus pollen. In a lot of about 250 Gandavensis seedlings, bloomed for the first time last summer, only three or four showed signs of Purpureo-auratus blood, although the flowers had quite as good a chance to be naturally fertilized by Purpureo-auratus pollen as did that species with Gandavensis pollen. Insects must have passed freely from one species to the other in order so effectually to cross-fertilize the Purpureo-auratus flowers. No Gandavensis seedlings showed traces of Dracocephalus blood.

To sum up the deductions. The species *G. purpureo-auratus* is very readily fertilized by Gandavensis pollen. The offspring of *G. purpureo-auratus* and *G. dracocephalus* crossed with *G. Gandavensis* are vigorous and readily set fertile seed. The hybrids are a direct combination of the two parents in color, form, habit and root, but with some new characters developed by the mixed blood.

It is sometimes thought, with garden-plants long in cultivation, from which seedlings have been raised in abundance and for a considerable time, that we have reached the end of the striking variations possible. Such a statement has been

* "The Species of Gladiolus," by W. E. Endicott; Garden and Forest, No. 31, page 363.

* A few of these hybrids were shown at the Massachusetts Horticultural Society last August, and were noticed in Garden and Forest, No. 28, p. 336.

made in regard to Gladioli. As a general conclusion this may be said to be emphatically incorrect. The limitations of hybridization, as regards what species may be crossed by what other species or even genera, are entirely unknown, and this is now the most inviting field for horticultural experiment. A keen pleasure is assured to the individual who shall strive to break the bonds of varietal variation, and by infusing new blood gain valuable and novel plants for the cultivator, and a furtherance of our knowledge of the conditions and effects of hybridization.

Boston. *Robert T. Jackson.*

Window Plants.—This is the season when complaint is most often made that window plants look sickly and that their leaves turn yellow and fall. Insects often cause the trouble, and in some cases it is because leaves are not kept clean. But more commonly too much water is given. When the pots are insufficiently drained the water remains stagnant about the roots. Roots need air, and when this is excluded no food is absorbed, the reserve material in leaf and stem is soon exhausted, and the plant is starved. Window-plants should have no water when the soil is damp. A plant is in a healthy condition when it is allowed to dry out until water is needed, and this demand should be made twice a week or oftener, according to the size of the pot and of the plant, the rapidity of transpiration and of evaporation from the soil. An aërated soil is essential to success with window plants, and it is just as necessary for the health of shrubs and trees. Last June a dam built across a little brook which runs through my meadow raised the water level of a pond, half a dozen square rods in extent, about two feet. A thrifty Tulip tree stood ten feet from the bank, but in a few days every leaf turned yellow and fell. So many of its feeding roots were shut out from air by the water that saturated the soil about them that the tree died of starvation.

Trenton, N. J. *S.*

Propagating Herbaceous Pæonias.—Four years ago some frames in the nursery were built where there had been a bed of herbaceous Pæonias, and after the frames had been filled with rich and light soil some weak shoots of Pæonias were seen pushing up from roots left in the soil. These plants were left for three years, when they were dug up and found to be set eighteen inches deep.

They had pushed a stalk through all this covering, and the stem, which in plants set near the surface would have been an annual one and would have died back to the crown of roots in autumn, had become a perennial trunk, full of axillary buds, and having strong roots directly under and feeding these buds, while the crown of roots at the bottom was also strong, but not so strong as when planted near the surface.

The benefit to the propagator from this remarkable change of habit of the plant is that a long stem full of buds and roots is produced which has only to be cut into short sections with the shears to furnish a large number of well-rooted plants. In dividing a stemless crown much fewer plants could have been obtained. But we still had the crown to divide, in addition to the long trunks, so that one plant made many rooted sets.

This method gives four or five times as many young plants as the ordinary one, and why can it not be applied as well to such herbaceous plants as Delphiniums, Hollyhocks, Aconites and Clematis? Of course it would be advisable to cover them in gradually as the stalk grew up, and not all at once, a method which might kill some plants. *F. L. Temple.*

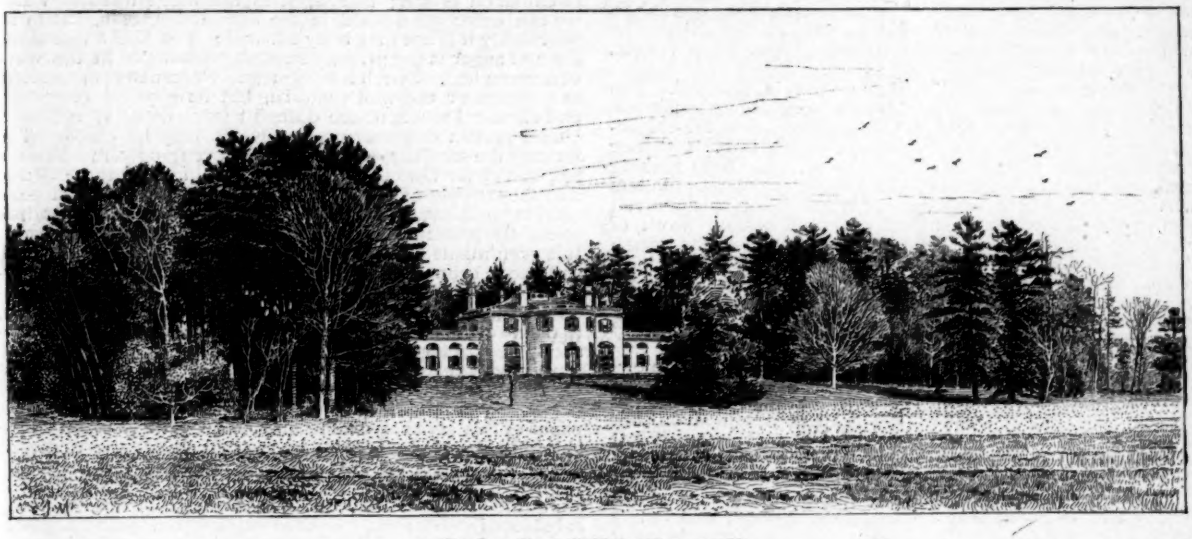
Somerville, Mass.

Orchid Notes.—*Cœlogyne cristata.* This is one of the best known of the tropical Orchids, and is a general favorite everywhere. It can be successfully grown and flowered in almost any kind of green-house, or in any soil, provided it be well drained. We grow large numbers of these Orchids, and they are now making a wonderful display of bloom. The flowers will last a long time when cut, add gracefulness to the heavier kinds when used in a vase, and relieve the rich colors of the more showy. When grown in baskets, the plants are useful for hanging in the dwelling-house. It is very little trouble to grow this plant, which needs to be repotted only once in three or four years, though it is benefited by an annual top-dressing of chopped leaves and moss. We grow them in a cool house, where the sash is kept down from June till September, and they are treated to a good drenching of water once or twice a day, until the bulbs are matured. The plants make fine stout bulbs, thoroughly ripened, and sure to give good spikes of bloom. The pure white variety, Alba, is at present somewhat rare, but, happily, it grows as freely as the type, and bids fair to become very plentiful in a few years. Another good variety, named Citrina, has long, narrow bulbs, more slender and bronzy green foliage. This flowers fully a month later than the species, and on that account it is a valuable kind, as it prolongs the flowering season till early spring. If possible it is more floriferous than the type; one plant with us has 112 spikes, which will yield some 600 flowers.

Dendrobium Endocharis is a charming little plant, the result of a cross between *D. Japonicum* and *D. aureum* (*heterocarpum*). The flowers, freely produced from the sides of the bulbs in twos or threes, are milk white, with a purplish striated blotch at the base of the lip. It has a delightful primrose fragrance, and grows freely in a pot or basket filled with a mixture of fibrous peat and moss. It requires a cool house, and should be kept moderately dry after growth is matured.

Kenwood, N. Y. *F. Goldring.*

Doronicums as Pot Plants.—Although the proper place for these showy Compositæ is the hardy flower-garden, they are also suitable for use as winter-flowering plants. If lifted with care in autumn, potted, and placed in a cool house, in the earlier months of spring an abundance of bright yellow flowers will be the result. Besides their beauty, the flowers have the additional value of lasting well when cut. With the above treatment we now have *Doronicum Caucasicum* in full bloom.



The Gore Place, Waltham.—See page 86.

This species does not exceed twelve inches in height, and does well in five-inch pots, making it a useful pot plant. *D. plantagineum excelsum* is also showing flower-buds. This is much taller in habit, and under liberal treatment it grows four or five feet high, with flowers four inches across. *D. Austriacum* and *D. Clusii* are equally desirable. After flowering in pots the plants may be placed in the border for the summer, and a second, and even third, crop of flowers will be produced if the soil is rich and abundant water is supplied.

Passaic, N. J. *E. Orpet.*

Principles of Physiological Botany, as Applied to Horticulture and Forestry.

VIII.—The Changes which Organic Matter Undergoes in the Plant.

THE preceding papers have outlined the mechanism by which organic matter is formed by plants. It has been shown that the green parts of plants possess the extraordinary power of constructing out of inorganic materials, taken from the air and soil, matter which is essentially like the very substance, of which both the framework and the living parts are made. It is now necessary to see what are the changes by which the simplest organic matter is transformed into various complex substances found in the plant.

For this examination a very brief review is essential. The efficient agent in the change by which inorganic materials are converted into organic matter is, as we have seen, the chlorophyll-granule (or its green pigment), which imparts to our ordinary plants their characteristic color. In some striking instances, this green color is hidden by other coloring matters which occur either in the shape of granules or as dissolved pigments; but wherever a leaf accomplishes the work of changing inorganic into organic matter, it does so through the agency of its chlorophyll, or some equivalent of chlorophyll. Moreover, in these granules, or in the cells which contain them, is effected also the equally important, but even more mysterious, change by which nitrogenous compounds are brought into combination with the simpler organic matter, and the whole substance endowed with life. The absolute necessity of sunlight, or light of substantially the same quality as sunlight from some indirect source, in the first step in the production of organic matter, has been commented on, but attention must now be called to the fact that many, if not indeed all, of the subsequent changes and combinations, can go on without light.

The radiant energy which falls upon the plant as sunlight is received by the cells which contain chlorophyll, and in the presence of the requisite inorganic materials upon which it acts, is transformed into another form of energy, which is retained. Chemically, this transformation in the plant always accompanies reduction of highly oxidized compounds, in which process a portion of the oxygen is released. The newly transformed energy is now to be turned to other forms (or, as one may say, different kinds of work) within the plant. Putting the same idea into the language of chemistry, we say that the newly constructed organic matter (formed by reduction from highly oxidized materials, carbon-dioxide and water) is now to be modified in many ways. But the principal ways are the following: (1) the construction of new living mattter, (2) the building up of new parts, including the repair of waste, and (3) the performance of such kinds of work as lifting, and transfers of all sorts. And when, after watching the expenditure of the treasured energy, or the consumption of the stored-up organic matters, we look at the ultimate products resulting therefrom, there meet us only the inorganic materials with which we started. In other words, we have followed the course of sunlight in its marvelous activities, and have come back to the point of departure. But between the first point, when we have before us sunlight acting on the green plant containing chlorophyll and employing carbon-dioxide and water in the presence of a small amount of dissolved earthy matter, as its raw materials, to the last point, at which, after all the products have been utilized and all the work done, we have only the raw materials back again, the distance is very great. Between these points the changes may be simply innumerable. Their multitude and complexity are best realized when we reflect upon the diversified products of the vegetable kingdom which man turns to account for his needs. All the timbers for shelter, the fibres for clothing, the starches, sugars, oils, nitrogenous matters and condiments for food, the perfumes, the dye-stuffs, tanning materials, gums, resins, and drugs in general, form but a small proportion, since these are only the very few of which man has yet discovered the uses and employed for his wants. Their multiplicity is so great that only a few characteristic changes of a general nature can be selected for present observation. For this purpose, in our hasty glance at these changes, or what is called metastasis, or metabolism, we must note that there is a building up, and there is likewise a pulling down—a treasuring and an expenditure of energy; and one of these is discernible in all the greater changes which go on within the plant. But there are a few changes which appear to be on a single plane, that is, there is no marked modification in the chemical composition of the materials, but simply a re-arrangement of their constituent atoms. In the plant, constructive metabolism, in its widest sense, includes the storing up of sunlight and the subsequent utilization of the formed materials in the making of new parts; on the other hand, destructive metabolism includes all those retrograde changes in material by which the stored energy does any sort of work.

For convenience it is well to look first at the organic products which contain no nitrogen. These may be roughly grouped into three classes, (1) the carbo-hydrates, (2) the fats, and (3) the vegetable acids.

1. The carbo-hydrates are of two general sorts, (1) the starch group and (2) the sugars. Starch is the first visible product of assimilation proper; that is, it is the first substance which we can detect as a solid in the assimilating cells, but in all probability it is not first body formed; it is likely that some form of sugar is the primary substance produced in the work of a green leaf. Starch has the same elementary composition as cellulose or cell-wall material, but its physical characters and chemical reactions are different from those of cellulose. Under certain circumstances cellulose may be employed as food by the seedling; but such cases occur only in instances like that of the hard seeds of dates, etc,, in which there is also a further supply of more easily utilizable food. Cellulose is used for building, not as food. Starch, on the other hand, is one of the principal forms in which food is treasured by plants. It is accumulated in underground parts, as roots and tubers, and above ground in leaves, stems and seeds, taking on characteristic shapes and markings. In many instances these distinctive characters enable one, by the use of the mi☆oscope, to detect cases in which starch from one source has been substituted by accident or design for another sort. One of the most interesting discoveries of modern times is the fact that these grains of starch accumulate through the intervention of colorless granules of living matter, which, as shown in the first paper of this series, are substantially the same in origin as the chlorophyll, or green granules, by which organic matter is constructed under the influence of sunlight.

There are many substances which are identical in atomic composition with cellulose and starch, namely, *inulin*, or the substance in which much of the food is stored in certain plants of the Sunflower Family, and *dextrin*, which occurs in much sap at the time when rapid building of new parts is going on. To the same group belong certain gums—for instance, Gum Arabic. These which we have mentioned are only a very few of the bodies allied to cellulose which are found in plants, but this brief reference to them may indicate the importance of the fact that out of precisely the same proportions of three elements, viz., carbon, oxygen and hydrogen, it is possible to derive substances so diverse in their appearance and physical properties. By comparatively slight changes in the chemical composition these are transformed into other substances, which will be discussed in the next paper.

Cambridge, Mass. *George Lincoln Goodale.*

The Forest.

Forestry in New England.

THE extracts which follow are from an address delivered before the Massachusetts Horticultural Society, at Boston, on February 9th, by Mr. J. B. Harrison, Secretary of the American Forestry Congress:

New England has in her own territory a conspicuous illustration of the value of an extensive tract of mountain forest, and of the evils which result from the destruction of the woods. The White Mountain region of New Hampshire was, in its natural condition, remarkable for the amount of beautiful scenery in a limited area—that is, for the number, interest and variety of its separate, complete landscapes. Each picture or scene was large enough to make the impression of individual and satisfying beauty, and there was little waste space between them. There was merely for each one a natural and charming frame.

I have time to-day to mention but one of the functions of this mountain forest—that of a place for summer rest and recreation; for sylvan peace and shade, coolness, beauty and refreshing change for men and women weary of the heat

and dust and noise and wearing care of life at home and in the towns. The preservation of these mountain woods for this use was of vital importance to the people of the nation in general, and the inhabitants of New Hampshire possessed in them a source of perpetual revenues. As population, wealth, leisure and the disposition to seek change of scene in summer increase in our country, these mountains and valleys have been thronged by an ever-changing multitude of guests, glad to have the opportunity of paying liberally for the comforts and luxuries of life while sojourning at the great mountain hotels. The region was worth more to the state than the richest gold mines would have made it. The one condition of a permanent and most liberal income was the protection and preservation of the forests. They are, in very great proportion, already ruined. They have been cut and burned away in most unintelligent disregard of their value. In consequence, the charm of the region is in great measure destroyed. The value of the hotel property will be seriously impaired, and many of the places which were once the loveliest are now desolate and hideous. The hills themselves are crumbling and dissolving, and a blight and curse are settling upon important parts of this sanctuary of beauty and peace. It might have been preserved uninjured forever; and yet it might have yielded another great revenue from the timber which it produces, most of which could have been cut, at proper times, without impairing the value of the forests in any way. All this would have been practicable, if we had been sufficiently civilized.

I have not time to speak of the loss by the destruction of this great source of timber supply, nor of the injury to the streams which have their sources here, the disastrous floods and the depleted summer flow, or the effect on the industries and subsistence of thousands of men and women in the great mill-towns between these mountains and the sea. The injury to New Hampshire agriculture is to be recognized, though it is less important, because most of the state is unsuited to cultivation, and should have been left permanently under forest conditions. Some portions of the hill-country of western Massachusetts, have, in a considerable degree, the same character as the mountain region of New Hampshire, and should be taken care of accordingly.

Men who own small tracts of woodland, especially successful lumbermen of towns and cities who have recently acquired them, are apt to thin and prune and drain and clear away the undergrowth, and, in short, to change as completely as possible all the conditions under which the trees had lived hitherto, and then wonder that the trees do not thrive. One thing necessary to most trees in this part of the country is shade. In New Hampshire, as in many other regions, the southern side of ravines and the north side of hills grow up to trees whenever they are protected from cattle and fire. But where the ground slopes to the south it remains bare. The trees will not grow, the young plants being scorched to death by the sun, and this is true of some of the level country where the land has been exhausted by tillage. Of course the forest would skirmish around and would cover such places in time, conquering them slowly from the edges, but such object-lessons are instructive, if we have eyes to see them. The chief things required for the successful management of such tracts of woodland is to protect them from fire and from pasturage, and then let them alone, mostly. The trees will do best under the conditions which produced them and have always nourished them hitherto.

The destruction of the timber of a forest by fire is a trivial loss compared with the permanent injury to the soil itself, which always results from forest fires. The burned land produces only inferior trees, and repeated burnings destroy the soil itself. We already have deserts of our own in this country created by this process, where the soil was before remarkably fertile. But, taking our whole country together, pasturage is a worse enemy to the forests than even fire, because it is everywhere. It operates more slowly, but it brings a ruin just as certain and complete, and where forest land is pastured there can be no permanent forest. If it is necessary or desirable to grow timber or trees in Massachusetts and New England, it is indispensible that some lands should be set apart for tree culture, and protected entirely from pasturage. The pasturage of woodlands is a feature of existing agricultural methods, in which a change might well begin, which should be extended to the whole matter of pasturage, and its relation to the fertility of the soil and to the profit and loss of farming. There can be no considerable advance or improvement, except by giving up some existing practices and methods, and adopting better ones in their stead. A little synthetic observation would convince thoughtful men that pasturage has too large a place in our present methods of agriculture, and that it is a wasteful and costly process, especially in its effect on the fertility of the soil. I think it would be an important step in a real advance in civilization if in Massachusetts and New England the pasturage of domestic animals were to a great extent gradually, and not too gradually, relinquished. This belief is sustained by more reasons than can be presented to-day. To feed cattle in-doors would enable farmers to save and utilize all the manure. In pastures it is largely wasted, and is often even an injury to the grass upon which it is dropped.

Forestry and arboriculture are chiefly economical subjects. Where tillage is more profitable than the production of timber or trees, the land should be cultivated. Where wood-products are the most profitable crop, there forest conditions should, of course, be maintained. But considerable intelligence, instruction, observation and forethought may be required to determine what lands are really available for profitable agriculture. A great deal of land is tilled and pastured in Massachusetts and New England which should never have been cleared or cultivated. When farms are abandoned it means that they should never have been farms. The land would have been more valuable under permanent forest conditions.

Our agricultural methods are steadily impairing the fertility and productiveness of a large proportion of the soil of our country. It is tilled and pastured to the last degree of exhaustion, and about everything that people can think of is done to hasten the process of impoverishment. A little while ago I saw the great wheat country of the Red River of the North all ablaze with the burning straw over hundreds of square miles.

We are not worth so much as we think we are. Much of our agriculture impairs and exhausts the capital invested in land. Methods that exhaust the soil of a country cannot rightly be regarded as civilized methods. The *wants* of our people are increasing. More and more is required to make life comfortable, interesting and satisfactory to the inhabitants of this country, while we deal most ignorantly and carelessly with the soil, which is the great store-house from which nearly all our wealth and means of subsistence must come.

I think that in Massachusetts and New England forestry and arboriculture should be considered largely in their relations to agriculture and to the permanent fertility and productiveness of the soil. It is important to observe that, while no method or system can reasonably be recommended which would be permanently unprofitable, yet much experiment is often necessary here in tree-planting and culture, as in other fields, and we cannot expect that each particular step or effort will in itself be profitable, or will yield a satisfactory return for the capital invested. No considerable advance is easily or quickly made, and changes are necessarily attended with some inconvenience.

There is no way of learning all about these subjects at once. People who read and study good papers and books on forestry are likely to know more about forestry and arboriculture than anybody else.

But the great need is, not that the people of Massachusetts and New England should accept any particular opinions or judgments regarding these subjects, but that they should examine these subjects with a new degree of attention and interest, especially in their economic aspects and relations. We do not need a sentimental fashion of talk about trees and tree-culture, but we do need, as a means to a most important end, to have the people of Massachusetts and New England think about trees, talk about them, read about them, write about them, until there is a tree-feeling in the air, and such a reverberation of sensible and practical teaching on the subject as will compel general attention.

Correspondence.

Shrubs for Shady Places.

To the Editor of GARDEN AND FOREST:

Sir.—Please give a list of shrubs which will flourish under the shade of deciduous trees.

Boston, January, 1889. *E. A.*

[The number of shrubs which can be grown under the shade of trees depends largely upon the density of the shade. If the trees under which it is desired to carpet the ground are growing close together, or if they are trees which produce a dense shade, it will be found difficult to establish a satisfactory growth of other plants under them. The Periwinkle is the best plant to use under such circumstances. It is an evergreen, very hardy, and, when once established, it will flourish in deep shade. The difficulty in

establishing this or any other plant in ground filled with the roots of old trees is found in the dryness of the soil, from which the tree-roots absorb all the moisture, rather than in the absence of light. Periwinkles or other shrubs used in this way will require, therefore, careful watering until they are fully established. When the shade is not dense almost any shrub can be successfully used under or among trees. The common Privet, the Barberry, Wild Roses, the native Cornels, Viburnums and Blueberries can all be used for this purpose. Rhododendrons, although they will not bloom in the shade, are good under-shrubs, and so is the Mahonia in those parts of the country where it is hardy. The growth under the dense forests of the southern Alleghanies, especially in the neighborhood of the streams, is often carpeted with a beautiful evergreen Andromeda (*A. Catesbæi*), which is one of the best of the shade-supporting plants. It is hardy in New England with a little careful protection. There could be found probably no better dwarf under-shrub for the Middle States than the European *Hypericum calycinum*, the so-called Rose of Sharon —a low, dwarf plant, which produces large yellow flowers during the summer, and which is very generally planted in England under trees, and always delights Americans who visit English gardens. This plant is not, unfortunately, very hardy in northern and eastern New England.

It is desirable, when possible, to plant the under-growth at the same time the trees, which are to shade it, are planted. If this plan is adopted the shrubs get a secure hold upon the ground, and become established before the trees are large enough to shade the ground, or to draw from it all its moisture. If this plan is adopted there is hardly a shrub which cannot be used in this way, although it must be remembered that there are few plants which can produce flowers abundantly without sunlight.—Ed.]

Mutilating Street Trees.

To the Editor of Garden and Forest:

Sir.—The people of St. Louis have for some years been in the habit of pruning and pollarding their trees, chiefly Ailanthus and Sycamore, but Maples and Elms in many instances. This treatment is usually given to young trees as soon as they have reached the height of the second-story windows, but for the past three or four years a severer method has been practiced, and trees that have struggled successfully with the vicissitudes of a city life until they have attained considerable size, have been topped off down to branches at least four inches in diameter. One row of some twenty or more Sycamores has been mangled to this extent by the neighborhood-carpenter. Will you kindly state what effect this is likely to have on the vitality of the trees? *F. C. P.*

St. Louis, Mo.

[The appearance of American cities and towns is seriously injured by the way in which ignorant and irresponsible men are allowed, in so many cases, to mutilate shade trees. Sometimes the cutting is done to satisfy the unreasonable demands of the various corporations operating wires; sometimes it is to gratify the whims of individual property owners. We can never hope that the streets of our cities and towns will be ornamented with handsome trees or properly protected from the summer sun, as long as the governing bodies delegate their authority to cut or prune trees to irresponsible agents of private corporations, and allow individuals to hack down every tree standing in a public thoroughfare which may be disagreeable to them. In every city and town there should be a responsible officer, familiar with trees and their requirements, whose special duty should be the planting and care of the street trees, and this officer should superintend the planting of all such trees, and their care and pruning, upon a system which should secure the greatest benefit to the greatest number. Until some plan like this is adopted, in accordance with popular interest and popular demand, there is little use in giving advice in cases like that in St. Louis, as described by our correspondent. Cutting off large branches from a healthy tree reduces its vitality, and, of course, should never be permitted. Severe pruning may be resorted to when a tree is in a feeble or perishing condition, when such an operation may stimulate vigorous growth. A wound made by cutting off a branch, unless it is immediately protected by a coating of coal-tar or of paint, is liable to be attacked with dry rot and other fungus-growth, and from the affected surface, the decay will gradually penetrate the whole tree and finally destroy it. It is merely a question of time when trees subjected to the treatment described by our correspondent must perish. There can, of course, be but one opinion as to the appearance of a street in which the trees are mutilated by the ordinary city laborer.—Ed.]

To the Editor of Garden and Forest:

Sir.—In your issue of May 3d, 1888, you kindly inserted an account of cases of inflammation of the skin of the hands and face of a florist and some of his assistants, which was attributed to the irritating action of some plant. *Primula obconica*, the only one handled by them for the first time that season, was held in especial suspicion as the possible offender. The cutaneous disturbance therein described, *dermatitis venenata*, subsided in a short time, and the skin of the three affected persons has remained in a healthy condition until recently. Within the last two or three weeks, however, they have all manifested a recurrence of the same symptoms, an eczematous inflammation of the hands and face, and in about the same degree as last year. They now feel assured that the trouble is caused by *Primula obconica*, for the condition did not develop until a few days after this plant was first offered for sale in the shop, where it was freely handled by them. The proprietor informs me that his hands and face became affected immediately after making it up into dinner-table decorations. He states also that some of those engaged in cultivating it have complained to him of a similar inflammation of the skin, which it has produced upon them. His other assistants in the shop, who were not thus affected last season, remain exempt this year.

It is desirable to know if other cultivators or florists have had a similar experience with this newly-introduced plant, or if other species of this large genus have exhibited irritating properties.

Harvard Medical School, Boston. *James C. White.*

Editor of Garden and Forest:

Sir.—Will you kindly inform me whether *Cypripedium insigne* is best propagated by seed or by division of the roots, and when the division should be made?

Plainfield, N. J. *C. D. W.*

[Raising Orchids from seed is a work requiring great skill and patience. The seeds are very fine, resembling chaffy dust. *Cypripedium insigne* is best propagated by dividing the crowns after it has done flowering, and care should be taken that each portion of the plant has some good roots attached. Each division should have two or three growths.—Ed.]

Recent Publications.

Contributions to American Botany, No. xvi., Sereno Watson. Proceedings of the American Academy of Arts and Sciences, vol. xxiv., and now issued separately.

Mr. Watson's sixteenth contribution to North American Botany is mainly devoted to the enumeration of a collection of plants made by Dr. Edward Palmer, in 1887, in the neighborhood of Guaymas, in Mexico, at Muleje and Los Angeles Bay, in Lower California, and on the island of San Pedro Martin, with descriptions of new species and critical notes. In the short introduction to this paper Mr. Watson calls attention to the fact that "the peninsula of Lower California and that portion of the Mexican mainland which borders the intervening gulf, though reputed a sterile land, have always, whenever they have been explored, yielded a rich harvest of novelties to the botanical collector. Much, therefore, was expected from so keen and careful a collector as Dr. Palmer, when he undertook to spend a season at Guaymas, and from that point to explore such other places as might be accessible to him. Though the season of 1887 proved very unfavorable on account of its dryness, the result has, nevertheless, been very satisfactory. Of the 415 native species collected, eighty-nine species—or more than one-fifth—are wholly new, and many others are of great interest in various respects.

"The larger part of the collection was made about Guaymas

itself, which town lies on the eastern side of the Gulf of California, in the State of Sonora, in latitude 28° N., and 250 miles south of the United States boundary. It is hemmed in closely by very rocky hills and low mountains (of 1,200 to 1,500 feet altitude), intersected by narrow valleys. The artificially watered gardens, with their irrigating ditches and brush fences, protecting and favoring the growth of numerous native plants, the rocky islands in the harbor, and the valleys and mountains around, were all alike searched."

"Muleje, upon the western side of the Gulf, ninety miles from Guaymas, is described as in a dry, barren and mountainous region, where, except in the very short, rainy season, the only green vegetation to be seen is along the banks of a small creek. This place was visited early in June, and again late in December. Of the forty-nine species collected there, twenty-four occurred elsewhere, mostly at Guaymas. Los Angeles Bay, also on the peninsula, about 200 miles north-west of Guaymas, was visited at an unusually favorable time, after a rain which was the first that had fallen in twenty-two months, and when vegetation was in full bloom. The surrounding country is very mountainous, some of the ridges having an altitude of 2,000 to 3,000 feet. About a month was spent here (from November 22d to December 20th), and 112 species were collected, of which twenty-three had been found previously by Dr. Palmer. The remaining station was the island of San Pedro Martin, lying about eighty miles north-west from Guaymas, of which a view has already appeared in this journal.

"The characteristics of the flora of the region bordering the Gulf of California, so far as shown by this collection, are for the most part those common to the flora of the whole arid region of the interior, from south-eastern California, Arizona and New Mexico southward into Mexico, distinct in a great measure from that of California proper on the one side and that of the Gulf States on the other. Nearly or quite two-thirds of the species range northward beyond the Mexican boundary. In the mountains about Guaymas we find a considerable number that are identical with or allied to species that have recently been collected by Pringle and Palmer in the mountains of Chihuahua. We have here also probably the northern limit on the Pacific coast of the tropical or sub-tropical genera Rhizophora, Hæmatoxylon, Portlandia, Citharexylum, Pedilanthus, Ficus, etc. The proportion in which the several orders are represented in the collection is remarkable. Of the 415 species, one-fourth are equally divided between the *Gramineæ* (50) and the *Compositæ* (50). Another fourth includes only the four orders, *Leguminosæ* (44), *Euphorbiaceæ* (32), *Malvaceæ* (17), and *Solanaceæ* (15). These are followed by the *Nyctaginaceæ* (15), *Convolvulaceæ* (13), *Asclepiadaceæ* (10), and fifty-three other orders with still fewer species. The important orders, *Ranunculaceæ*, *Rosaceæ*, *Saxifragaceæ*, *Umbeliferæ*, *Ericaceæ*, *Cupuliferæ*, *Coniferæ* and *Orchidaceæ*, are wholly unrepresented. Excluding the *Cyperaceæ* and *Gramineæ*, there are only five endogenous species in the entire collection."

Mr. Watson proposes the new genera for plants collected by Dr. Palmer: Malperia in *Agerateæ*, for an erect annual near Hafmeisteria; Pelucha in *Peluchenieæ*, a shrubby plant related to Pelucha; and Pattalias, an Asclepiad of the Metastelma group. Among the new species are apparently several plants of very considerable interest. Among these are three species of Figs, one with edible fruit, and a new Palm, referred to the small genus Washingtonia, of which the type is the now well-known Fan Palm of southern California. A few of Dr. Palmer's new plants which seem to possess real horticultural value have already been drawn, and will be figured from time to time, as opportunity permits, in the pages of this journal.

Mr. Watson's paper ends with the description of a few new species of plants lately found in the United States, chiefly in California.

Periodical Literature.

The January issue of *Hooker's Icones Plantarum*, being Part I. of the nineteenth volume, is of more than usual interest to American botanists, containing, as it does, the portraits of a number of plants of the Bahama Islands, which in their flora are closely united with the southern extremity of Florida. The Bahama plants figured are *Phialanthus myrtilloides*, a representative of a Rubiaceous genus confined to the Island of Cuba, with the exception of the present species, which is found also in the Bahamas; *Mimosa Bahamensis*, one of the few plants endemic on the Bahamas, the fruit now first made known by Eggers' collecting; *Acacia acnifera*, another endemic Bahaman species, which, as Mr. Baker points out, is closely related to the now widely-distributed *A. Farnesiana* of our Texano-Mexican region; *Acacia choriophylla*, a small tree, now only known from these islands; *Salmea petrobioides*, a Helianthoid Compositæ, a Bahaman representative of a large West Indian and Mexican genus; *Buxus Bahamensis*, a Bahaman species, now first described, and related to the Jamaican *B. Vahlii* and the Cuban *B. retusa* and *B. gonoclada;* and *Pinus Bahamensis*, a tree forty feet high, and described by Baron Eggers as forming dense woods on the Island of New Providence. *P. Bahamensis* was first described by Griesbach from a cone preserved in the Kew Museum, which Dr. Engelmann suggested ("Revision of the genus Pinus," p. 25), should, perhaps, be referred to *Pinus Cubensis*, a view which the present figure abundantly sustains. Indeed, judging from this figure, the Bahama plant, with the exception of the somewhat stouter mucros on the scales of the cone, is exactly identical with specimens of *Pinus Cubensis* from the Florida Keys, in which the leaves are in threes, while on the trees on the mainland of the North American continent they are often in twos.

This part contains figures of a number of Indian species of Liparis, and a continuation of the new Chinese plants now in course of elaboration in the Kew Herbarium. There is an excellent figure also of the great Peruvian Ranunculus (*R. macropetalus*), which sometimes attains a height of four feet, with large, globose-campanulate flowers, which are believed to be red. This is the species which M. Raimonde says is given by the Indians to their children "*pour les faire parler plus promptement.*"

In the February number of *Scribner's Magazine* Mr. Austin Dobson writes a charming gossipy article on "Old Vauxhall Gardens," the famed resort of English fashion during the latter half of the eighteenth century. The pictures from old prints which accompany his words assist them in showing that, while Vauxhall was undoubtedly an admirably designed place of recreation, it had little of the character which we usually associated with the name of garden. Miss Burney called it "formal," and so, in the extremest sense, it was. The garden covered about ten acres, and was divided by a Grand Walk, at the end of which stood a statue of Aurora, afterwards replaced by a "grand Gothic obelisk." "Beyond the end of this walk was a *ha-ha*, which separated the gardens from the hay-fields then adjoining it. Parallel to the Grand Walk ran the South Walk, with its triumphal arches; next to this again was the covered alley known indifferently as the Druid's, or Dark Walk . . . and last came a fourth walk open at the top. Other walks, the chief of which was the Cross Walk, traversed the garden from side to side, and in the quadrangle formed by the Grand Walk, the Cross Walk, the South Walk and the remaining side of the grounds was a space of about five acres. This, which lay to the right of the entrance, was known as the Grove." The Grove was furnished with an elaborate music-stand, a building called a "Turkish Tent," and upon occasion, with supper tables in the open air. Colonnaded arcades flanked many of the walks; pavilions and statues were everywhere scattered about, and at one end of the Cross Walk stretched a large picture representing ruins and running water. Many other details are given by Mr. Dobson, but these may suffice to show the general lines upon which this famous garden was formed. As a garden, we repeat, it is not very interesting to read about, but the many notable persons whose footsteps can be traced within its borders, and the many mentions made of it in last-century literature—all these collected and gaily annotated by the author, serve to provide a most entertaining chapter.

Recent Plant Portraits.

STREPTOCARPUS PARVIFOLIA, *Botanical Magazine*, January, *t.* 7036; a native of the Cape of Good Hope.

MACODES JAVANICA, *Botanical Magazine*, January, *t.* 7037; a scarlet-flowered, terrestrial Orchid, the beauty of which "resides in deep green, velvety leaves, the light-green, longitudinal nerves of which are united by groups of transverse, snow-white, irregular streaks, much like those of *Dichorisandra mosaica*, but more delicate."

SCUTELLARIA ALPINA, *Révue Horticole*, January 1st.

CAPPARIS SPINOSA, *Révue Horticole*, January 1st.

SOBRALIA ZANTHOLEUCA, *Gardeners' Chronicle*, January 5th.

JACHIADENUS CARINATUS, *Gardeners' Chronicle*, January 12th; "this is a pretty stove annual of the Gentian order. . . . The flowers are produced in autumn, and last over a month without fading. The corolla tube is white, from two to three inches long, the color of the lobes being bright purple. The plants like a well drained soil and plenty of moisture at the root always."

Notes.

Flowers of the Hepatica, gathered in the woods near Boston, were displayed before the Massachusetts Horticultural Society on the 26th of January.

Monsieur Hemie de Vilmorin, one of the best known and best liked horticulturists in Europe, has been elected President of the Botanical Society of France.

From a note in a recent number of *Le Moniteur D'Horticulture* it appears that M. Bleu, a well-known Parisian Orchid-grower, has succeeded in obtaining a cross between *Odontoglossum Roezlii* and *O. vexillarium*. Two specimens, showing slight variations themselves, have now flowered, the plants being only four years and nine months from seed. They are intermediate in character between the two parents.

Cherokee Roses in small quantities are at last to be seen in at least one Boston florist's window. It is surprising that they are not grown more frequently, for there is scarcely a flower which is more lovely. From the florist's point of view, however, the plants take up too much space, as they must be planted out and well established before good crops of flowers can be had from them, while only one crop, lasting from four to six weeks, is produced annually.

The Annual Report of the School of Forestry connected with the Indian Forest Department, and situated at Dehra Dun, shows that seventy-five students were under instruction during the year 1887–88. Of these, fifty-six were supported by Government, nine were deputed by native states and ten were private students. The copies of the examination papers joined to the Report indicate the thoroughness of the scheme of instruction, and show that a high standard of education is aimed at for the future guardians of the Indian forests.

Monsieur Joly, of Paris, has recently published a pamphlet in which he describes a famous Black Hamburgh Grape-vine which grows on the estate of the Marquis of Breadalbane, in England, and is believed to have been planted in 1832. Its stem, at one foot from the ground, measures two feet in circumference, while its branches cover an area of some 4,275 square feet, and during the year 1888 it yielded about 3,000 bunches of grapes. These facts denote a vine almost equal in size to the famous one at Hampton Court, planted in 1769, which is likewise of the Black Hamburgh variety.

At the meeting of the Society of American Florists in this city last summer a resolution was adopted setting forth the advantage to the trade of flower-pots of uniform size and shape, and a copy of the resolution was sent to all the potteries in the United States. In response to this call the Whilldin Pottery Company has already placed the standard pot upon the market, and other manufacturers will, no doubt, follow the example. Besides the evident gain from uniformity, the rim at the bottom of these pots saves a great deal of the loss from breakage when they are set down smartly on the bench to settle the soil. The added band stiffens them at the top, and they can be packed more closely and securely.

At a late meeting of the Massachusetts Horticultural Society a resolution was adopted authorizing the President to appoint a committee of five to consider the subject of national and state forestry, the need of further legislation to protect the forests on our national domain, and the best means to promote a greater interest in arboriculture. Dr. Walcott named as the committee, Charles S. Sargent, John Robinson, J. D. W. French, Francis H. Appleton and Leverett M. Chase. The appointment of similar committees by the horticultural and agricultural societies of other states would tend to encourage a more careful study of forest problems by thoughtful men, and their recommendations would doubtless prove of practical value.

So rapidly were the mountain sides in the neighborhood of Cape Town being denuded of their flowering plants by the reckless hands of cockney pedestrians, that the local government not long ago passed stringent laws for their preservation. Now botanists and tourists complain that these laws are so very stringent as to interfere with all lawful pleasure as well as all scientific research. "Here," says a correspondent of the *Gardeners' Chronicle*, "is the text of the definition of 'forest produce' which may not be touched under penalty: 'Game, fish, minerals, stones, earth, trees, timber, firewood, wattles, kraal wood, branch wood, slabs, chips, sawdust, plants, grass, reeds, thatch, rushes, bedding, peat, creepers, fibres, leaves, moss, flowers, ferns, fruits, seeds, roots, bulbs, galls, spices, bark, gum, resin, sap, charcoal, honey, wax, shells, horns, ivory, and generally anything growing or contained in the forest'!!! Anything else? Could it not be enacted that the respectable subject or botanical student should be blindfolded before going up, to further atone for the stupidity of a few 'snobs' who could easily have been stopped without enacting such absurdities?"

A correspondent of the *Gardeners' Chronicle* makes the complaint so often heard in this country, that the trees on the streets and in the open spaces of London are annually mutilated by the saw and bill-hook of the ignorant pruner. He adds: "In my neighborhood—a south-western suburb—the young trees on the common were last year pruned in much the same fashion as a Currant-bush, and this has been the rule since they were planted in 1885. The result is seen in little conical heads, full of small twigs, the general outline of a tree being a *fac simile* of those of a German toy. It is possible by banishing the 'pruners' for all time, that the trees would throw out vigorous branches, and grow into picturesque objects, affording shelter from the rain and sun to the many young and aged persons who make use of the common, and become a pleasant picture to a district rapidly gaining in importance."

Mr. Flinders Petrie discovered not long ago in Egypt the remains of a number of Roses which had been bound into a garland and buried with the dead. The tomb from which they came was one of those which contained the encaustic paintings recently described and illustrated in *Scribner's Magazine*, and date from between the second and the fifth centuries after our era. Monsieur Crépin has examined these Roses, and recently read a paper relating to them before the Royal Society of Belgium. The nine blossoms he had secured were all imperfect, but evidently belonged to the same species. So far as he could judge, they resembled most closely a Rose cultivated in Abyssinia to-day, which was described by A. Richard under the name of *Rosa sancta*, as it is grown in the vicinity of temples. *R. sancta*, which is very similar to *R. centifolia* or *R. Gallica*, appears not to be a native of Abyssinia, but to have been cultivated there from a very distant period. Nor could the Roses found in the tomb have been of native origin, as no Rose grows wild in Egypt. But the flowers were doubtless obtained near the place of sepulchre, as Roses were largely cultivated in Lower Egypt and exported thence to Rome. The only native Rose known in this east African region is one that occurs in the mountains of Abyssinia—*R. Abyssinica*—believed to be a variety of *R. moschata*.

In a recent number of the *Revue Horticole* the following sensible words were printed: "Whatever may be the degree of intensity in the coloration of foliage, it can never play the same rôle as flowers in the summer decoration of a garden. A mass of Coleus or Achyranthes, a basket-bed or garland of one sort or another or a mosaic pattern in bright foliage, may be usefully employed in a decorative composition of considerable extent; but they cannot produce the same attractive and gay effect as flowering plants used in a mingled way or in distinct groups. Recently we saw an example that was pushed to an extreme point—a basket-bed entirely composed of *Coleus negro*, with dark, almost black, violet-purple foliage, and bordered with Achyranthes, the leaves of which showed a net-work of green and yellow. The impression made by this basket was inexcusably mournful. One vaguely imagined the existence of a *tumulus* under this mass of flowerless plants, and some sort of funereal urn would not have seemed inappropriate in the middle of it. This was certainly not the effect that had been desired, and we might cite many other cases where an injudicious use of colored foliage had produced negative or disagreeable results. The general rules to follow may be summed up thus: Reserve colored foliage for spots which are to be seen from a distance, in masses, and plant near the house and in all other much-frequented spots those flowering plants which, in addition to their elegance and their varied bloom, usually disseminate a grateful odor."

Catalogues Received.

A. D. Cowan & Co., 114 Chambers Street, New York;—Seeds.—Henry A. Dreer, 714 Chestnut Street, Philadelphia, Pa.;—Seeds, Plants, etc.—Ellwanger & Barry, Mount Hope Nurseries, Rochester, N. Y.;—Select Roses.—J. T. Lovett Co., Little Silver, N. J.;—Ornamental and Fruit Trees, Plants, etc.—A. M. & J. B. Murdoch, 510 Smithfield Street, Pittsburgh, Pa.;—Trees, Shrubs, Vines, Seeds, etc.—Pitcher & Manda, United States Nurseries, Short Hills, N. J.;—Single Dahlias; also, Chrysanthemums.—Jas. M. Thorburn & Co., 15 John Street, New York;—Seeds.

Publishers' Note.—The publishers wish to state that the advertisement of L. D. Staples, Portland, Mich., which appeared in last week's issue of Garden and Forest was inadvertently inserted.